ETHERNET APPLICATIONS

AUTOMOTIVE - one of Ethernet's latest success stories. Forecast predicts up to 700 million ports of Ethernet will ship by end of 2023. Ethernet links within car can provide data using Single Pair Ethernet (SPE) to reduce the cost while providing economies of scale and interoperability. Richer multimedia experiences, autonomous driver assistance systems (ADAS), roll-out of autonomous vehicles and convergence of legacy in-vehicle networking (IVN) technologies towards Ethernet are the key drivers for Ethernet adoption in cars. Meanwhile, Ethernet is reducing the weight of the vehicle tonnage by enabling the consolidation of multiple electrical systems into a single power supply rather to offer converged network.

ENTERPRISE - and Campus applications are a huge market for Ethernet with over a billion ports shipping per year. Most of these ports are Base-T or the access layer, with both multi-mode and single-mode fiber links. While this is a promiscuous, optical and copper Ethernet ports are moving from 10G-40G to 25/50G.

SERVICE PROVIDERS - have driven higher-speed Ethernet solutions for decades, including router connections, MPLS, client side optics for transport network (OTN) equipment, and wireless and wired broadband. In particular, the 5G mobile deployment is driving dramatic increases in both broadband and broadcast applications and continues to push Ethernet to higher rates and longer distances. With global demand by consumers for video, there are signs of change. The aggregated bandwidth seen in service provider networks continues to push for increased Ethernet speed, currently reaching for 1.6 Tb/s. Synchronous Ethernet has become a critical technology used in the Telco collagen of 5G networks and services, a massive adoption of this technology is expected over the next few years.

CLOUD PROVIDERS - were the first to adopt 10GE, servers on a large scale in 2011 for hyperscale data centers. In the 2020’s, with exascale appetite for applications like AI and Machine Learning, hyperscale servers have moved to 25GE and are transitioning to 50GE, 100GE and beyond. Unique networking architectures with these workloads make data centers have driven a mix of copper cables, both multi-mode fiber and single-mode fiber solutions at 10G, 25G, 40G and 80GE. The bandwidth demands of both hyperscale data centers and service providers continue to grow exponentially and they are adopting similar technologies. The gap in products and requirements of the Telecom and Cloud services providers has rapidly closed over the last years, with both providers adopting similar technologies as the bandwidth demands increase.

INTEROPERABILITY AND CERTIFICATION

The Ethernet Alliance is committed to building industry and end-user confidence in Ethernet standards through multi-vendor interoperability demonstrations and plugfests. Our Full Certification Program raises the bar on certification, setting the highest standard for true interoperability.

Our industry-defined PoE Certification Test Plan is based on the IEEE 802.3bt standards, and products passing this test will be granted the Ethernet Alliance PoE Certification Logo. The trademarked logo provides instant recognition for products based on these standards, and increases multi-vendor interoperability between products bearing it. The logo indicates the power class and product type providing clear guidance to which devices will work with each other.

The first generation of the program (Gen 1) certifies Type 1 and Type 2 products using 2-Pair of wires (PoE). The second generation of the program (Gen 2) certifies Type 3 and Type 4 products using 2-Pair and 4-Pair of wires. See table below for details.

Building & Industrial Automation applications are moving from older Fieldbus style networks to Ethernet. This move has been accelerating over the last decade, with Ethernet as a key enabling technology for the Fourth Industrial Revolution aka Industry 4.0. The main themes of Industry 4.0 are Interconnection, Information, Transparency, Technical Assistance and Decentralized Decision: 1. Adopting Ethernet provides these applications access to all the networking technology that has developed over the last 40 years, as well as physical layers developed specifically for harsh OT environments. 2. In contrast, with SPE 2.5GE Time Sensitive Networking (TSN) is revolutionizing automation. In turn, automation applications are seeing Ethernet development return to its roots such as 10G and 100Mb/s speeds and shared media using new technology.

For digital version of the roadmap and for latest Ethernet industry resources, please visit: www.ethernetalliance.org

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